

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of: §  
Cecilia BRANDEL, et al. §  
§ Art Unit: Not Yet Assigned.  
Serial No.: Not assigned §  
§  
Filing Date: Herewith § Examiner: Not Yet Assigned

For: A METHOD OF ESTIMATING THE PITCH OF A SPEECH SIGNAL USING A  
BINARY SIGNAL, USE OF THE METHOD, AND A DEVICE ADAPTED THEREFOR

Commissioner of Patents  
Box Patent Application  
Washington, D.C. 20231

CERTIFICATE OF MAILING BY EXPRESS MAIL

"EXPRESS MAIL" Mailing Label No.EL525018757US

Date of Deposit: APRIL 5, 2001

I hereby certify that this paper or fee is being deposited with the U.S.  
Postal Service "Express Mail Post Office to Addressee" service under  
37 CFR 1.10 on the date indicated above and is addressed to the  
Commissioner of Patents, Washington, D.C. 20231

Type or Print Name: Dorothy MacKinnon .....

*Dorothy MacKinnon*  
Signature .....

Sir:

**PRELIMINARY AMENDMENT**

Prior to commencing the examination of the above-identified application, please amend the  
application as set forth below to place the application in condition for allowance.

**In the Specification**

On page 1 of the Specification, in the Title, please **delete**:

[A METHOD OF ESTIMATING THE PITCH OF A SPEECH SIGNAL USING A  
BINARY SIGNAL, USE OF THE METHOD, AND A DEVICE ADAPTED THEREFOR]

and **replace** with the following amended Title:

A METHOD AND DEVICE FOR ESTIMATING THE PITCH OF A SPEECH SIGNAL,  
USING A BINARY SIGNAL

On page 1 of the Specification, at line 1, before "**Field of the Invention**," please **add** the following section:

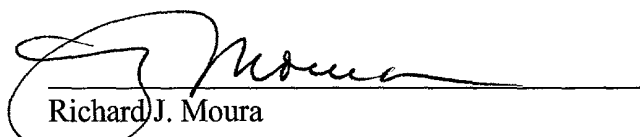
CROSS REFERENCES TO RELATED APPLICATIONS

This application for patent claims the benefit of priority from, and hereby incorporates by reference the entire disclosure of, co-pending U.S. Provisional Application for Patent Serial No. 60/197,044, filed April 14, 2000.

REMARKS

In view of the foregoing amendment, the pending the application is respectfully submitted to be in condition for allowance, and action to that end is respectfully requested. Applicant hereby certifies that this amendment does not add new matter to the patent application.

Respectfully submitted,

  
Richard J. Moura  
Reg. No. 34,883

JENKENS & GILCHRIST, P.C.  
3200 Fountain Place  
1445 Ross Avenue  
Dallas, TX 75202-2799  
(214) 855-4709  
(214) 855-4300 FAX

**MARKED UP VERSION OF AMENDMENTS**

[A METHOD OF ESTIMATING THE PITCH OF A SPEECH SIGNAL USING A BINARY SIGNAL, USE OF THE METHOD, AND A DEVICE ADAPTED THEREFOR]

A METHOD AND DEVICE FOR ESTIMATING THE PITCH OF A SPEECH SIGNAL, USING A BINARY SIGNAL

CROSS REFERENCES TO RELATED APPLICATIONS

5        This application for patent claims the benefit of priority from, and hereby incorporates by reference the entire disclosure of, co-pending U.S. Provisional Application for Patent Serial No. 60/197,044, filed April 14, 2000.

Field of the Invention

10        The invention relates to a method and device for estimating the pitch of a speech signal, for example, in telephones.

Background of the Invention

15        In many speech processing systems it is desirable to know the pitch period of the speech. As an example, several speech enhancement algorithms are dependent on having a correct estimate of the pitch period. One field of application where speech processing algorithms are widely used is in mobile telephones.

20        A well known way of estimating the pitch period is to use the autocorrelation function, or a similar conformity function, on the speech signal. An example of such a method is described in the article D.A. Krubsack, R. J. Niederjohn, "An  
25        Autocorrelation Pitch Detector and Voicing Decision with Confidence Measures Developed for Noise-Corrupted Speech", IEEE

**CLEAN COPY OF AMENDMENTS**

A METHOD AND DEVICE FOR ESTIMATING THE PITCH OF A SPEECH  
SIGNAL, USING A BINARY SIGNAL

CROSS REFERENCES TO RELATED APPLICATIONS

This application for patent claims the benefit of  
priority from, and hereby incorporates by reference the entire  
disclosure of, co-pending U.S. Provisional Application for  
Patent Serial No. 60/197,044, filed April 14, 2000.

**Field of the Invention**

The invention relates to a method and device for estimating the  
pitch of a speech signal, for example, in telephones.

**Background of the Invention**

In many speech processing systems it is desirable to know the  
pitch period of the speech. As an example, several speech  
enhancement algorithms are dependent on having a correct  
estimate of the pitch period. One field of application where  
speech processing algorithms are widely used is in mobile  
telephones.

A well known way of estimating the pitch period is to use the  
autocorrelation function, or a similar conformity function, on  
the speech signal. An example of such a method is described in  
the article D.A. Krubsack, R. J. Niederjohn, "An  
Autocorrelation Pitch Detector and Voicing Decision with  
Confidence Measures Developed for Noise-Corrupted Speech", IEEE